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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/824,310

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Junko Yotani

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11/21/2008

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EXAMINER

STOUFFER, KELLY M

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/21/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

|                              |                                      |                                      |  |
|------------------------------|--------------------------------------|--------------------------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b><br>10/824,310 | <b>Applicant(s)</b><br>YOTANI ET AL. |  |
|                              | <b>Examiner</b><br>KELLY STOUFFER    | <b>Art Unit</b><br>1792              |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 01 October 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>9/15/08</u> .   | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Arguments***

Applicant's arguments filed 1 October 2008 have been fully considered but they are not persuasive. The applicant argues that Uemura in view of Liu does not teach a "fluffy" film nor a film with a uniform height from the substrate. However, as far as the meaning of "fluffy" can be construed from the instant claims and specification, it appears that Uemura et al. teaches this limitation as shown in Figures 3 or 8, for example. Further, Figure 8 shows a film with a uniform height, as does Figure 4, as broadly as it is claimed. Liu also shows in Figure 7 that it was known in the prior art to use a laser to make a uniform height on a film. Therefore, the rejections of the previous office action are maintained. New grounds of rejection appear below for new claim 9.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uemura et al (US 6,522,055 B2, thereafter, US'055) in view of Liu et al (US 7,064,474 B2, thereafter, US'474).

Regarding claim 1, US'055 teaches a method of manufacturing an electron-emitting source (Abstract, Col.1, lines 8-28, Fig.1-9, and Col.6, line 20 to Col.8, line 28 of US'055). US'055 teaches forming the cotton-like film, within the film, each nanotube fiber has one end connected to the surface of substrate and curled or entangled with other nanotube fibers (Col.3, lines 35-47 of US'055). US'055 further teaches electric field is applied uniformly over curled or entangled nanotube fibers to smooth its surface (Col.6, lines 1-19 of US'055). US'055 does not specify irradiating the film with a laser beam irradiation perpendicularly to the substrate. However, using a laser beam irradiating the nanotube in a manufacturing process of an electron-emitting device is a known technique. US'474 teaches a method to make a field emission device (entire document). US'474 teaches a laser beam could be used to open the tips and purify the carbon nanotubes (Col.1, line 50-Col.2, line 3 of US'474). US'474 teaches laser beam irradiation perpendicularly on the substrate (Fig.3, Col.4, line 50 to Col.5, line 3 of US'474), which reads on the laser beam irradiating process as recited in the instant claim. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to apply laser beam irradiation perpendicularly to the substrate as demonstrated in US'474 in the process of US'055 because US'474 teaches the irradiation of laser beam could contribute to a decreased threshold voltage required for field emission by the carbon nanotubes (Col.4, Lines 28-38 of US'491). As far as the meaning of "fluffy" can be construed from the instant claims and specification, it appears that Uemura et al. teaches this limitation as shown in Figures 3 or 8, for example. Further, Figure 8 shows a film with a uniform height, as does Figure 4, as broadly as it

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is claimed. Liu also shows in Figure 7 that it was known in the prior art to use a laser to make a uniform height on a film.

Regarding claims 2-4, US'055 teaches using thermal CVD (Claim 3) to make carbon nanotube (claim 2) by using iron substrates (claim 4) (Col.6, line 20 to Col.8, line 28 of US'055).

Regarding claims 5-7, US'474 teaches that an excimer laser (claim 6) is used as an irradiating source with a power of each pulse 300 millijoules/cm<sup>2</sup>(claim 5) under a the protection of an ambient gas (claim 6).

Regarding claims 8 and 9, the limitations of these claims are disclosed as discussed above with claim 1.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KELLY STOUFFER whose telephone number is (571)272-2668. The examiner can normally be reached on Monday - Thursday 7:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kelly Stouffer  
Examiner  
Art Unit 1792

kms

/Timothy H Meeks/  
Supervisory Patent Examiner, Art Unit 1792

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